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NAVIGATION SYSTEM, NAVIGATION METHOD AND NAVIGATION CARD FOR A MEANS OF LOCOMOTION

FIELD OF THE INVENTION

The present invention relates to a navigation system for an arrangement for locomotion, i.e., a transportation device, in particular, for use in a vehicle, motor vehicle, ship or aircraft, to navigate from one location to a navigation destination, the navigation system having a radio receiver, such as a car radio, and a navigation unit, with a key card being provided that is insertable into a key card reader of the radio receiver to establish the operational readiness thereof, with the radio receiver also being connected to the navigation unit for transferring navigation destinations thereto. The present invention also relates to a navigation method for an arrangement for locomotion for use in a vehicle, motor vehicle, ship or aircraft, to navigate from one location to a destination, using a radio receiver, such as a car radio, and a navigation unit, with at least the navigation destination being entered into the navigation unit via the radio receiver. The present invention further relates to a navigation card for a navigation system for an arrangement for locomotion, such as a vehicle, motor vehicle, ship or aircraft, to navigate from one location to a navigation destination, the navigation system having a radio receiver, such as a car radio, and a navigation unit.

BACKGROUND INFORMATION

In an arrangement for locomotion, such as motor vehicles, aircraft or ships, permanently installed navigation systems quickly, easily and safely guide a driver of the arrangement for locomotion from a present location to a desired destination without the driver of the arrangement for locomotion having to go to the trouble of planning a route and acquiring the necessary cards beforehand. For this purpose, navigation data based, for example, on maps, geographic maps or city street maps, is stored in the navigation system, for example on CD-ROM. The navigation unit may use GPS (Global Positioning System) to determine a present location and calculate corresponding navigation instructions that lead to a predetermined destination. The navigation data may include data about streets and routes for motor vehicles.

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However, before the navigation system is able to perform its function and calculate a route from the location to the destination for navigational guidance purposes, a user must enter the desired destination and possibly also the present location. This is done, for example, from a keypad or a similar manually operated input device.

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SUMMARY OF THE INVENTION

The object of the present invention is to provide a navigation system and a navigation method that provide more applications for the user and is easier to operate.

10 According to the present invention, this object is achieved by providing at least one navigation card corresponding to the key card, with a memory on this card containing at least one navigation destination of particular interest, for example tourist sights, for optional transmission to the navigation unit as the navigation destination.

15 This has the advantage that the navigation system additionally serves, for example, as a tour guide, making guided tours of this type easily, economically and at any time available simply by inserting a navigation card into a key card reader of the radio receiver.

To provide the user with descriptions and information about activated points of interest, the
20 navigation card also includes audio data relating to the stored points of interest, with this data being playable via the radio receiver when the navigation unit determines that the present location of the arrangement for locomotion corresponds to a navigation destination belonging to this audio file in the form of a point of interest.

25 Different navigation cards are suitably provided for different cities.

According to the present invention, a navigation method of the type mentioned above involves inserting a key card for this navigation card into the radio receiver, having the location of a point of particular interest output from this card as the navigation destination
30 and transferring it to the navigation unit for navigational guidance purposes.

To provide the user with descriptions and information about activated points of interest, an audio file associated with this point of interest is output from the navigation card and played upon reaching the navigation destination.

User-selectable navigation destinations corresponding to points of particular interest that are stored on the navigation card inserted into the radio receiver are displayed for the purpose of putting together an individual sightseeing tour.

To carry out entire sightseeing tours, a sequence of multiple navigation destinations corresponding to points of interest are automatically read from the navigation card and transferred to the navigation unit for navigational guidance purposes, with a subsequent navigation destination always being read and transferred once a preceding navigation destination has been reached.

To provide a reference to or information about additional points of interest located along the navigation route, such as tourist sights or historical locations, audio data is read from the navigation card and played during navigational guidance to a navigation destination corresponding to a point of interest.

According to the present invention, the navigation card of the type mentioned above is designed as a key card for the radio receiver, with points of interest for the navigation unit connected to the radio receiver being stored on the navigation card.

This has the advantage that it provides a standardized arrangement for making points of interest available as navigation destinations, which may be used by any navigation system having a radio receiver and a key card reader without requiring additional hardware.

Audio files explaining the points of interest or other audio files that contain sound effects are additionally stored on the navigation card. When this audio file is played upon reaching a certain point of interest, the user is provided with additional acoustic information about this point of interest, for example a tourist sight, or the audio file conveys a specific sound effect corresponding to the point of interest to him.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates a schematic block diagram of a preferred embodiment of a navigation system according to the present invention.

DETAILED DESCRIPTION

The preferred embodiment, illustrated in Figure 1, of a navigation system 100 according to the present invention includes a navigation unit 10, having a navigation processor 12, and a radio receiver 14. If the navigation unit according to the present invention is installed in a motor vehicle, the radio receiver is, for example, a car radio. An antenna 16 is connected to radio receiver 14 as well as to an internal GPS (Global Positioning System) device (not illustrated) of navigation unit 10. Navigation unit 10 is connected to an acoustic output device 18 to output navigation instructions. Radio receiver 14 is also connected to acoustic output device 18 to play back audio transmissions. Using a keyboard 20, a user enters commands or navigation destinations and possibly also a present location into navigation unit 10 via the navigation processor, which processes manual input of this type. A number of different CDs 24, which include, among other things, a navigation CD having a digital map base, are arranged in a CD changer 22.

A key card (not illustrated) for establishing the operational readiness of radio receiver 14 is insertable into radio receiver 14. This key card uniquely serves as an antitheft device, since radio receiver 14 is unusable, and therefore worthless, without the key card. For this purpose, the key card contains a memory that holds corresponding authorization information.

According to the present invention, navigation cards 26 corresponding to this key card in terms of shape and memory allocation, are also provided, with these cards being readable by the key card reader of radio receiver 14 and the memory provided therein containing additional information relating to points of interest as navigation destinations, such as museums, historical city districts and other tourist sights, as indicated by block 28. Different navigation cards 26 contain, for example, navigation destinations corresponding to the tourist sights of different cities. Navigation processor 12 is able to access this data stored on navigation card 26, as indicated by arrows 30, however with navigation card 26 continuing to be inserted into the key card reader (not illustrated) of radio receiver 14 provided for the key card.

After navigation card 26 has been inserted, the navigation destinations corresponding to tourist sights or other points of interest stored thereon are displayed on a display 32, for example, allowing a user to select one ore more navigation destinations, which are then transferred to the navigation unit, i.e., navigation processor 12, in the form of a sightseeing tour, with the system subsequently providing navigational guidance to the corresponding tourist sights.

Navigation card 26 is inserted, for example, only for the purpose of entering the desired navigation destination and calculating a corresponding route. To continue using radio receiver 14, the corresponding key card is then reinserted.

In addition, information corresponding to the tourist sights, for example, is stored in spoken form on navigation card 26, for example as an audio file. This audio file is invoked and played as soon as the arrangement for locomotion has reached a tourist sight that was previously entered as a navigation destination. For this purpose, navigation card 26 remains inserted into radio receiver 14 even after the navigation destination has been entered and the route calculated.

By way of example, a memory of a navigation card according to the present invention has the following contents:

Museum	Including spoken explanation.
Historical city district	Including spoken explanation.
Forest areas	Including spoken explanation.
Zoo	Including spoken explanation.
Opera house	Including specific sound effects, such as a piece of classical music.
Train station	Including train schedules which are reproducible as speech, where for example

	train connections leaving during a presettable period of time after arrival at the station being output.
Highway rest areas	Including voice output of services available at the rest area, such as gas station, restaurant, etc.

Etc.

For example, if "sightseeing tour" is selected, a route within the historic part of town is suggested. The above-mentioned key words are therefore associated with multiple navigation destinations. This data is retrieved from navigation card 26, and the system provides navigational guidance to parking spots close to the different navigation destinations having corresponding tourist sights and plays corresponding audio files that explain the respective tourist sights. Audio instructions are also given during navigational guidance, with a traffic safety warning being suitably output beforehand for safety reasons, and with the user being able to turn these audio instructions off during the trip.

The present invention thus opens up a new range of applications for navigation systems 100 that include a navigation unit 10,12 having a radio receiver 14, i.e., a car radio. The present invention is preferably used, for example, for bus tours. In addition, regional tourism boards may create and offer corresponding navigation cards 26. In this regard, it is particularly advantageous to provide navigation cards 26 that have identical navigation destinations, but audio files in different languages. The use of the key card reader belonging to radio receivers 14 establishes a standard, thus eliminating the need to provide additional hardware in either navigation system 100 or radio receiver 14.